

ABSTRACT

A method and system is disclosed for communicating information from a downhole location to the surface. A plurality of releasable vessels are positioned downhole, each containing signal information affixed to the vessels prior to placement of the vessels downhole. The signal information indicates the presence of at least one of three or more predetermined downhole conditions. A detecting system is positioned on the surface such that the signal information can be detected on one or more of the vessels. The predetermined downhole condition can be characteristic of the fluid being produced in the borehole, such as water fraction, a certain level of mechanical wear or damage to downhole equipment such as bit wear, or the firing a one or more charges on a wireline deployed perforation tool.

A sensing and releasing system is described that senses the occurrence of the downhole condition, such as a simple threshold, and release the vessels in response to the sensing. The vessels are located at a number of downhole locations, and travel to the surface via convection. The vessels include a radio frequency devices that acquires substantially all energy needed for operation by exposure to externally created electromagnetic field, such as an RF tag or simple dipole antenna.